Geophysical Research Abstracts
Vol. 13, EGU2011-5037, 2011
EGU General Assembly 2011

The hydrological impacts and large-scale atmospheric dynamics of the 2009-10 wet winter in Portugal

Cristina Andrade (1), João A. Santos (2), Joaquim G. Pinto (3), and João Corte-Real (4)

(1) Instituto Politécnico de Tomar, Escola Superior de Gestão de Tomar, Área Interdepartamental de Matemática, Tomar, Portugal (c.andrade@ipt.pt), (2) CITAB, University of Trás-os-Montes e Alto Douro, Portugal, (3) Institute for Geophysics and Meteorology, University of Cologne, Germany, (4) Institute of Mediterranean Agrarian and Environmental Sciences (ICAAM), Group Water, Soil and Climate, University of Évora, Portugal

Due to the damaging effects of reduced precipitation in Portugal on the environmental and socio-economic systems, the anomalously wet winter of 2009-10 had a very important impact on the Portuguese hydrological system. It is shown that the 2009-10 winter was largely beneficial by reversing the accumulated precipitation deficits during the previous hydrological years. The recorded anomalously high precipitation amounts have contributed to an overall increase in river runoffs and dam recharges in the four major river basins in Portugal. It is shown that the high precipitation amounts were triggered by an anomalously strong westerly flow component over the North Atlantic. Furthermore, a dynamically coherent enhancement in the frequencies of mid-latitude cyclones close to Portugal, were also accompanied by significant increases in the occurrence of cyclonic, south and south-westerly circulation weather types. The prevalence of the strong negative phase of the North Atlantic Oscillation (NAO) is still worth mentioning. The 2009-10 winter hydrological and atmospheric conditions is compared with the previous two anomalously wet winters (1995-96 and 2000-01) in order to isolate not only their similarities, but also their contrasting conditions stressing out the limitations of estimating winter precipitation amounts in Portugal using exclusively the NAO phase as predictor.